WHAT IS CLAIMED IS:

1. A photovoltaic device, the device comprising:

a first layer comprising a first semiconductor material comprising a first conductivity type;

a second layer comprising a second semiconductor material of a second opposite conductivity type, wherein the second conductivity type is opposite the first conductivity type; and

a third layer comprising a third semiconductor material, wherein the third layer is situated between the first layer and the second layer, wherein the third layer comprises a porous layer, wherein the third layer comprises a translucent layer, and wherein the third layer comprises a diffusion barrier.

2. The photovoltaic device according to claim 1, wherein the third layer comprises a thickness of from about 1 nm to about 50 nm.

3. The photovoltaic device according to claim 1, wherein the photovoltaic device comprises a device selected from the group consisting of a photodiode, a photoresistor, and a solar cell.

4. The photovoltaic device according to claim 1, wherein the first semiconductor material, the second semiconductor material, and the third semiconductor material comprise a same semiconductor material.

5. The photovoltaic device according to claim 1, wherein the first semiconductor material, the second semiconductor material, and the third semiconductor material comprise a same element or a same combination of elements.

6. The photovoltaic device according to claim 1, wherein the first semiconductor material, the second semiconductor material, and the third semiconductor material are selected from the group consisting of Si, Ge, and GaAs.

7. The photovoltaic device according to claim 1, wherein the first semiconductor material, the second semiconductor material, and the third semiconductor material comprise silicon.

8. The photovoltaic device according to claim 1, wherein the second semiconductor material and the third semiconductor material comprise a same semiconductor material.

9. The photovoltaic device according to claim 1, wherein the second semiconductor material and the third semiconductor material comprise a same element or a same combination of elements.

10. The photovoltaic device according to claim 1, wherein the second semiconductor material and the third semiconductor material are selected from the group consisting of Si, Ge, and GaAs.

11. The photovoltaic device according to claim 1, wherein the first semiconductor material and the third semiconductor material comprise a same semiconductor material.

12. The photovoltaic device according to claim 1, wherein the first semiconductor material and the third semiconductor material comprise a same element or a same combination of elements.

13. The photovoltaic device according to claim 1, wherein the first semiconductor material and the third semiconductor material are selected from the group consisting of Si, Ge, and GaAs.

14. The photovoltaic device according to claim 1, wherein the first semiconductor material and the second semiconductor material comprise a same semiconductor material.

15. The photovoltaic device according to claim 1, wherein the first semiconductor material and the second semiconductor material comprise a same element or a same combination of elements.

16. The photovoltaic device according to claim 1, wherein the first semiconductor material and the second semiconductor material are selected from the group consisting of Si, Ge, and GaAs.

17. The photovoltaic device according to claim 1, wherein the third semiconductor material comprises a non-doped semiconductor material.

18. The photovoltaic device according to claim 1, wherein the third semiconductor material comprises a crystalline semiconductor material.

19. The photovoltaic device according to claim 1, wherein the third layer comprises a material selected from the group consisting of a multicrystalline semiconductor material and a monocrystalline semiconductor material.

20. The photovoltaic device according to claim 1, wherein the second layer comprises a crystalline semiconductor material.

21. The photovoltaic device according to claim 1, wherein the second layer comprises a material selected from the group consisting of a monocrystalline semiconductor material and a multicrystalline semiconductor material.

22. The photovoltaic device according to claim 1, wherein the first layer comprises a thickness of from about 3 nm to about 100 nm.

23. The photovoltaic device according to claim 1, further comprising an amorphous silicon layer, wherein the amorphous silicon layer is situated between the first layer and the third layer.

24. The photovoltaic device according to claim 1, further comprising a fourth layer, wherein the second layer is attached to the fourth layer, wherein the fourth layer comprises a porous layer comprising a fourth semiconductor material, and wherein the fourth semiconductor material comprises non-doped crystalline silicon semiconductor material.

25. The photovoltaic device according to claim 24, further comprising a fifth layer, wherein the fourth layer is attached to the fifth layer, wherein the fourth layer and the fifth layer comprise a same conductivity type, and wherein the fifth layer comprises a material selected from the group consisting of amorphous silicon semiconductor material, nanocrystalline semiconductor material, and microcrystalline silicon semiconductor material.

26. The photovoltaic device according to claim 1, wherein the second layer comprises a plurality of macro etch pits comprising a diameter of greater than about one micron, and wherein a portion of the macro etch pits comprise a plurality of fine etch pits comprising a diameter of less than about one micron.

27. A method for fabricating a photovoltaic device, the method comprising the steps of:

providing a second layer comprising a second semiconductor material comprising a second conductivity type;

fabricating or depositing a third layer comprising a third semiconductor material on the second layer, wherein the third layer comprises a porous layer, wherein the third layer comprises a translucent layer, and wherein the third layer comprises a diffusion barrier; and

fabricating or depositing a first layer on the third layer, wherein the first layer comprises a first semiconductor material comprising a first conductivity type, and wherein the second conductivity type is opposite the first conductivity type.

28. The method of claim 27, further comprising the step of:

texturing the surface of said second layer, wherein the step of texturing is conducted before the step of fabricating or depositing the third layer.

29. The method of claim 28, wherein the step of texturing the surface comprises acid etching the surface.

30. The method of claim 27, wherein the third layer comprises a thickness of from about 1 nm to about 50 nm.

31. A method for fabricating a photovoltaic device, the method comprising the steps of:

providing a second layer comprising a second semiconductor material comprising a second conductivity type;

fabricating or depositing a fourth layer on the second layer, wherein the fourth layer comprises a fourth semiconductor material, wherein the fourth layer comprises a porous layer, and wherein the fourth semiconductor material comprises a non-doped crystalline silicon semiconductor material;

fabricating or depositing a fifth layer on the fourth layer, wherein the fifth layer comprises a material selected from the group consisting of amorphous silicon semiconductor material, nanocrystalline semiconductor material, and microcrystalline silicon semiconductor material, wherein the fourth layer and the fifth layer comprise a same conductivity type;

fabricating or depositing a third layer on the fifth layer, wherein the third layer comprises a porous layer, the third layer comprising a third semiconductor material,

wherein the third layer comprises a translucent layer, and wherein the third layer comprises a diffusion barrier; and

fabricating or depositing a first layer on the third layer, wherein the first layer comprises a first semiconductor material comprising a first conductivity type, and wherein the second conductivity type is opposite the first conductivity type.

32. A method for fabricating a photovoltaic device, the method comprising the steps of:

providing a second layer comprising a second semiconductor material comprising a second conductivity type;

fabricating or depositing a third layer comprising a third semiconductor material on the second layer, wherein the third layer comprises a porous layer, wherein the third layer comprises a translucent layer, and wherein the third layer comprises a diffusion barrier;

fabricating or depositing an amorphous silicon layer on the third layer; and

fabricating or depositing a first layer on the amorphous silicon layer, wherein the first layer comprises a first semiconductor material comprising a first conductivity type, and wherein the second conductivity type is opposite the first conductivity type.

33. The method of claim 32, further comprising the step of:

texturing the surface of said second layer, wherein the step of texturing is conducted before the step of fabricating or depositing the third layer.

34. The method of claim 33, wherein the step of texturing the surface comprises acid etching the surface.

35. The method of claim 32, wherein the third layer comprises a thickness of from about 1 nm to about 50 nm.

36. A method for fabricating a photovoltaic device, the method comprising the steps of:

providing a second layer comprising a second semiconductor material comprising a second conductivity type;

fabricating or depositing a fourth layer on the second layer, wherein the fourth layer comprises a fourth semiconductor material, wherein the fourth layer comprises a

porous layer, and wherein the fourth semiconductor material comprises a non-doped crystalline silicon semiconductor material;

fabricating or depositing a fifth layer on the fourth layer, wherein the fifth layer comprises a material selected from the group consisting of amorphous silicon semiconductor material, nanocrystalline semiconductor material, and microcrystalline silicon semiconductor material, wherein the fourth layer and the fifth layer comprise a same conductivity type;

fabricating or depositing a third layer on the fifth layer, the third layer comprising a third semiconductor material, wherein the third layer comprises a porous layer, wherein the third layer comprises a translucent layer, and wherein the third layer comprises a diffusion barrier;

fabricating or depositing an amorphous silicon layer on the third layer; and

fabricating or depositing a first layer on the amorphous silicon layer, wherein the first layer comprises a first semiconductor material comprising a first conductivity type, and wherein the second conductivity type is opposite the first conductivity type.